

ABSTRACT

A magnetic random access memory is composed of a plurality of first signal lines provided to extend in a first direction, a plurality of second signal lines provided to extend in a second direction substantially perpendicular to the first direction, a plurality of memory cells respectively provided at the intersections of the plurality of first signal lines and the plurality of second signal lines, and a plurality of magnetic structures respectively provided to the plurality of memory cells. Each of the plurality of memory cells has a magneto-resistance element containing a spontaneous magnetization layer which has a first threshold function, and the direction of the spontaneous magnetization of the spontaneous magnetization layer is reversed when an applied magnetic field having the intensity equal to or larger than a first threshold function value is applied. Each of the plurality of magnetic structures has a second threshold function, and generates a magnetic structure magnetic field in response to a structure-applied magnetic field. When the structure-applied magnetic field has the intensity equal to or larger than the second threshold function value, a third magnetic field is generated as the magnetic structure magnetic field. When the structure

applied magnetic field has the intensity less than the second threshold function value, a fourth magnetic field is generated which is weaker than the third magnetic field as the magnetic structure magnetic
5 field. A first write current supplied to one of the plurality of first signal lines as a first selected signal line, and a first magnetic field is generated. A second write current is supplied to one of the plurality of second signal lines as a second selected
10 signal line, and a second magnetic field is generated. A first synthetic magnetic field of the first magnetic field and the second magnetic field is applied to the magnetic structure as the structure applied magnetic field. The element applied magnetic field having the
15 intensity equal to or larger than the first threshold function value is applied to the selected memory cell provided at the intersection of the first selected signal line and the second selected signal line. A second synthetic magnetic field of the first synthetic
20 magnetic field and the magnetic structure magnetic field is generated as the element applied magnetic field such that the element applied magnetic field having the intensity less than the first threshold function value is applied to each of non-selected
25 memory cells other than the selected memory cell.